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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,091	04/08/2004	Kevin W. Schlichting	EH-10972 (04-107)	8980
34704	7590	08/03/2006	EXAMINER	
BACHMAN & LAPOINTE, P.C. 900 CHAPEL STREET SUITE 1201 NEW HAVEN, CT 06510			ZIMMERMAN, JOHN J	
			ART UNIT	PAPER NUMBER
			1775	

DATE MAILED: 08/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

OFFICE ACTION

Amendments

1. This Office Action is in response to the Amendment Under 37 C.F.R. 1.111 received July 2, 2006. Claims 1-18 and 26 are pending in this application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-18 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schaeffer (U.S. Patent 5,843,586) in view of Wukusick (U.S. Patent 6,074,602) and further in view of applicant's disclosure of the prior art.

4. Schaeffer discloses that coated single crystal substrates used for combustor liners (e.g. see column 3, lines 40-59; column 1, lines 15-30) can have their crystallographic orientation optimized so the low modulus directions (e.g. [001]) will correspond with the maximum strain (e.g. see column 4, line 33 - column 5, line 34). Schaeffer discloses that the thermal and

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mechanical stresses induced during operation of the turbine components are greater in different directions and that Schaeffer's invention identifies thermal and mechanical stresses regions of fcc single crystal components and orients the crystallographic directions accordingly (e.g. see column 5, line 35 - column 6, line 14). While the examples of Schaeffer are primarily drawn to single crystal turbine blades, one of ordinary skill in the art would be competent in identifying the thermal and mechanical stresses of the additional components specifically described by Schaeffer (i.e. combustor liners) and determining how best to orient the crystallographic directions for these components according to Schaeffer's teachings. Schaeffer (e.g. column 4, lines 13-21) furthermore discloses that suitable materials for his invention include those single crystal alloys disclosed in U.S. Patent Application Serial No. 08/270,528 (now U.S. Patent 6,074,602 to Wukusick et al.) which discloses fcc single crystal alloys which consists essentially of 5-10 wt.% Cr, 5-10 wt.% Co, 3-8 wt.% Ta, 5-7 wt.% Al, 3-8 wt.% W (e.g. see claim 1 of the Wukusick patent) and a gamma prime volume fraction in excess of 60% (e.g. see claim 11 of the Wukusick patent). Although the range endpoints of Wukusick are not the same range endpoints of the claimed composition, the ranges overlap and therefore the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, see *In re Malagari*, 182 USPQ 549. Since Schaeffer discloses the application of his invention alternatively for turbine blades and combustor liners, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the compositions and principles disclosed by Schaeffer would be applicable to the manufacture of combustor liners. Schaeffer may differ from some of

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the pending claims in that Schaeffer does not illustrate gas turbine combustor panel configurations, but the examiner notes that the illustration of the gas turbine combustor structure of applicant's Figure 1 is a typical combustor configuration in the art. It would have been obvious to one of ordinary skill in the art to apply the teachings of Schaeffer to typical prior art combustor panel configurations because Schaeffer discloses that his teachings result in improved useful life of turbine components. Applying Schaeffer's teachings within predetermined alignment tolerances and/or using simulations to determine alignment goals would be within the purview of one of ordinary skill in the art and would have been obvious in order to optimize the invention of Schaeffer and also to determine acceptable performance tolerances for various components, compositions and/or environments. Using Schaeffer's teachings to make original and/or replacement turbine combustor components would have been obvious to one of ordinary skill in the art at the time the invention was made because one of ordinary skill in the art would readily appreciate that the improved properties conferred by Schaeffer's teachings would benefit original and/or replacement components alike.

5. Claims 1-18 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brown (U.S. Patent 5,682,747) in view of applicant's disclosure of the prior art and Gell (U.S. Patent 4,116,723).

6. Brown discloses that single crystal substrates used for combustor shields can have their crystallographic orientation optimized so that the primary crystal orientation will be identified relative to the axial direction of the heat shield member while the secondary crystal orientation is

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normal to the primary crystal orientation and in the plane of the base portion (e.g. see column 4, lines 12-31). Brown discloses the crystallographic orientation suggested by his invention promotes durability with respect to the stresses within the shield components. Brown may differ from the claim 8 in that the Rene N5 composition in the example may not be the same, applicant disclose that the compositions of Gell (e.g. U.S. Patent 4,116,723) are typical prior art single crystal compositions used in gas turbine components (e.g. see paragraph [0023]). It would have been obvious to one of ordinary skill in the art at the time the invention was made that compositions used for turbine blades would be of sufficient durability for combustor shields because they are developed specifically to withstand the extreme stresses and high temperatures in turbine engines. Although the range endpoints of the fcc gamma prime single crystal alloys of Gell (e.g. see claim 1 of Gell) are not the same range endpoints of the applicant's claimed composition (e.g. see applicant's claim 8), the ranges overlap and therefore the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, see *In re Malagari*, 182 USPQ 549. Brown may differ from some of the pending claims in that Brown may not illustrate the same type of gas turbine combustor panel configurations as those illustrated by applicant, but the examiner notes that the illustration of the gas turbine combustor structure of applicant's Figure 1 is a typical combustor configuration in the art. It would have been obvious to one of ordinary skill in the art to apply the teachings of Brown to any typical prior art combustor panel configurations because Brown discloses that his teachings result in improved useful life of turbine combustor components. Applying Brown's teachings within

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predetermined alignment tolerances and/or using simulations to determine alignment goals would be within the purview of one of ordinary skill in the art and would have been obvious in order to optimize the invention of Brown and also to determine acceptable performance tolerances for various components, compositions and/or environments. Using Brown's teachings to make original and/or replacement turbine combustor components would have been obvious to one of ordinary skill in the art at the time the invention was made because one of ordinary skill in the art would readily appreciate that the improved properties conferred by Brown's teachings would benefit original and/or replacement components alike.

7. Claims 1-18 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gemma (U.S. Patent 4,605,452) in view of Schaeffer (U.S. Patent 5,843,586) and Gell (U.S. Patent 4,116,723) and further in view of applicant's disclosure of the prior art.

8. Gemma discloses that fcc single crystal turbine blade should have their crystallographic orientation optimized so that the [001] primary orientation will correspond with the z axis of the part since the [001] crystal orientation is particularly suited to thermal fatigue resistance (e.g. see claims 1-11). While the disclosure of Gemma differs from the pending claims in that Gemma is drawn primarily to the manufacture of single crystal turbine blades, Schaeffer clearly shows that one of ordinary skill in the art clearly understands that the optimization of the single crystal orientation of turbine blades applies also the manufacture of combustor liners (e.g. see column 3, lines 40-46). In view of Schaeffer, it would have been obvious to one of ordinary skill in the art that the crystallographic orientation optimization of Gemma for turbine blades would apply

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equally well to the stresses in turbine combustion liners. As shown by Schaeffer, one of ordinary skill in the art would be competent in identifying the thermal and mechanical stresses of the turbine combustor components and determining how best to orient the crystallographic directions for these components. Gemma further discloses that the compositions of Gell (e.g. U.S. Patent 4,116,723) are typical prior art single crystal compositions used in gas turbine components for his invention (e.g. see column 5, lines 29-49). It would have been obvious to one of ordinary skill in the art at the time the invention was made that compositions used for turbine blades would be of sufficient durability for combustor shields because they are developed specifically to withstand the extreme stresses and high temperatures in turbine engines. Schaeffer confirms the alternative use of turbine technology for blades and combustors alike. Although the range endpoints of the fcc gamma prime single crystal alloys of Gell (e.g. see claim 1 of Gell) are not the same range endpoints of the applicant's claimed composition (e.g. see applicant's claim 8), the ranges overlap and therefore the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, see *In re Malagari*, 182 USPQ 549.

Regarding typical gas turbine combustor panel configurations, the examiner notes that the illustration of the gas turbine combustor structure of applicant's Figure 1 is a typical combustor configuration in the art. In view of Schaeffer, it would have been obvious to one of ordinary skill in the art to apply the teachings of Gemma to typical prior art combustor panel configurations in order to improve the useful life of turbine components. Applying Gemma's teachings within predetermined alignment tolerances and/or using simulations to determine

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alignment goals would be within the purview of one of ordinary skill in the art and would have been obvious in order to optimize the invention of Gemma and also to determine acceptable performance tolerances for various components, compositions and/or environments. Using Gemma's teachings to make original and/or replacement turbine components would have been obvious to one of ordinary skill in the art at the time the invention was made because one of ordinary skill in the art would readily appreciate that the improved properties conferred by Gemma's teachings would benefit original and/or replacement components alike.

9. Regarding the use of applicant's disclosure of the prior art in the rejections, above, it is axiomatic that consideration of the prior art cited by the examiner must, of necessity, include consideration of the admitted state of the art found in applicant's specification, *In re Davis*, 305 F.2d 501, 134 USPQ 256 (CCPA 1962); *In re Hedges*, 783 F.2d 1038, 228 USPQ 685 (Fed. Cir. 1986). Admitted knowledge in the prior art may be used in determining patentability of the claimed subject matter, *In re Nomiya*, 509 F.2d 566, 184 USPQ 607 (CCPA 1975).

Response to Arguments

10. Applicant's arguments received July 2, 2006 have been considered. Applicant argues that the examiner "improperly cited only the broadest ranges of Wukusick et al. Wukusick et al. contained several levels of more specific teachings that teach away from the presently claimed combinations". In response to applicant's argument, the examiner notes that Wukusick is not held to his "preferred" or "most preferred" embodiments. A reference is valid for all that it discloses. See MPEP 2123 and MPEP 2141.02 (VI). Wukusick's disclosures of "preferred" or

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"most preferred" embodiments does not "teach away" from the broader "base" range. Patent case law clearly establishes that the phrase "teaching away" means to suggest that the reference suggests unsuitability, or the reference criticizes, discredits, or otherwise discourages the embodiment or solution claimed. *In re Fulton*, 391 F.3d 1195, 1201, 73 USPQ2d 1141, 1146 (Fed. Cir. 2004). On the contrary, Wukusick clearly suggests that the alloy compositions in Table 1 ("Base", Preferred" and "Most Preferred") *should be used* in practicing his invention. It is not clear how applicant has determined that Wukusick "teaches away" from his own "Base" alloy ranges. In any event, Wukusick discloses specific examples in Table II which fall directly in applicant's claimed ranges in pending claims 1-18. Regarding pending claim 26, there is no factual evidence of record that the claimed ranges are patentably distinct over the composition ranges disclosed by Wukusick. A prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a *prima facie* case of obviousness. *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003). See MPEP 2144.05. It is *applicant's* burden to show that the narrower range is patentably distinguishable over the broader range. A very careful review of applicant's disclosure shows no factual evidence of any patentable distinction of the range of claim 26 over the base composition range disclosed by Wukusick. Regarding applicant's allegation of "obvious to try", the examiner is not contending that it would be obvious *to try* the proposed modification. The denigration of this rationale is recognized, *In re Antonie*, 195 USPQ 6 (CCPA 1977). The examiner's position is rather that the invention would have been obvious *to do*. The differences here suggest making the proposed modification, *In re Clinton*, 188 USPQ 365 (CCPA 1976). Regarding applicant's argument that the examiner's conclusion of obviousness is based upon improper "hindsight"

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reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

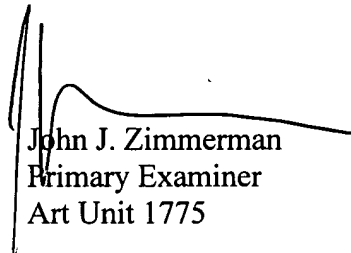
Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Zimmerman whose telephone number is (571) 272-1547. The examiner can normally be reached on 8:30am-5:00pm, M-F. Supervisor Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



John J. Zimmerman
Primary Examiner
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jjz
July 28, 2006